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International filing date (day/month/year) 02 July 1998 (02.07.98)	
Applicant LEIMAND, Henrik	

1. The designated Office is hereby notified of its election made:

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03 February 1999 (03.02.99)

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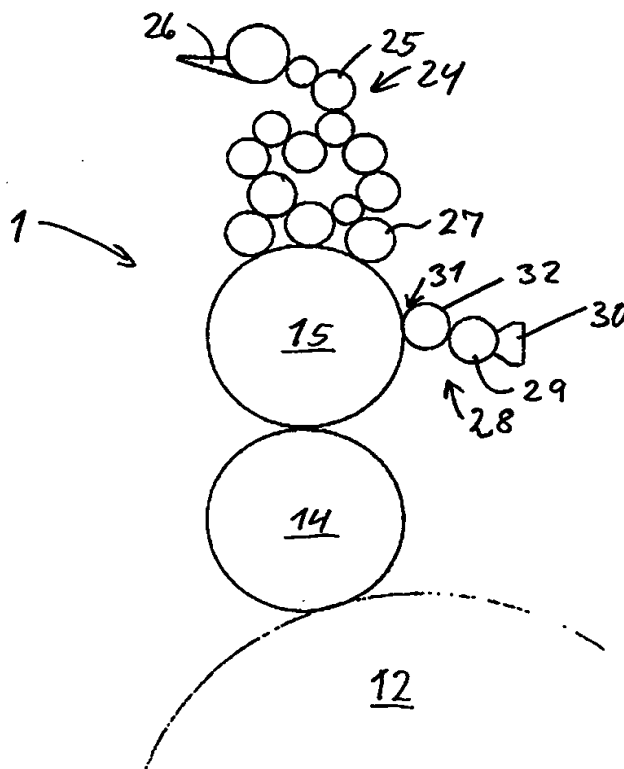


INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/DK98/00303 (22) International Filing Date: 2 July 1998 (02.07.98) (30) Priority Data: 0800/97 3 July 1997 (03.07.97) DK (71) Applicant (for all designated States except US): TRESU A/S [DK/DK]; Eegsvej 14-16, DK-6091 Bjert (DK). (72) Inventor; and (75) Inventor/Applicant (for US only): LEIMAND, Henrik [DK/DK]; Engdrægt 18, DK-6091 Bjert (DK). (74) Agent: PATRADE A/S; Store Torv 1, DK-8000 Århus C (DK).		(81) Designated States: AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GE, GH, GM, GW, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>In English translation (filed in Danish).</i>

(54) Title: METHOD OF OPERATION OF A PRINTING UNIT AND PRINTING UNIT FOR OFFSET MACHINE**(57) Abstract**

There is disclosed a printing unit (1) for use in an offset machine. The printing unit allows a broader use of offset machines (1). This is achieved in that the lacquer application means and the water application means comprise a unit (28) consisting of a doctor blade chamber device (30) and at least one roller (29, 32) for transferring lacquer or water from the doctor blade chamber device (30) to the plate cylinder (15) of the printing unit.



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METHOD OF OPERATION OF A PRINTING UNIT AND PRINTING UNIT FOR OFFSET MACHINE

The present invention relates to a method of operation of a printing unit and a printing unit for use in an offset machine comprising lacquer application means and water application means.

Offset machines are known in the art and therefore will only be briefly explained. A web or a sheet to be printed is passed between printing rollers or transfer rollers. The web or the sheets are made to abut on a blanket cylinder for application of the print to be applied in the individual printing unit in the offset machine. The blanket cylinder is in contact with a plate cylinder which transfers the colour print which is to be placed on the web. The plate cylinder is in contact with dampening unit and an inking unit applying damp and ink, respectively. Thus, an offset plate on the plate cylinder will be rotated whereby water receptive parts are dampened by the rollers of the dampening unit. Then the ink receptive parts of the offset plate are provided with ink from the inking rollers in the inking unit. The formed image is then applied to the blanket cylinder which in turn applies the ink onto the web or the sheet. Preferably a paper web is used, but other materials may also be used for printing.

A printing unit according to the present invention may be used in a traditional offset machine, for example of the type disclosed in EP 767.058. The contents of this patent application is hereby incorporated by reference, as the printing unit may form a part of an offset machine constructed according to the same principle and with the same sheet feeder and sheet delivery means at the beginning and the end of the printing unit, just like there may be used similar means for transferring paper web or sheets between different, consecutive printing units to apply the finished image to the web. Likewise, the same type of printing ink may be employed. Offset machines may be equipped with a lacquering unit. The lacquering unit will typically be constructed with a plate cylinder onto which the lacquer is applied from a roller arrangement which is supplied from a pan with clear lacquer.

It is the object of the present invention to provide a method of operation of a printing unit and a printing unit for an offset machine allowing a broader use and a more effective operation of printing units in existing offset machines. Furthermore, it is an object to provide a printing unit which simultaneously may be used for application of lacquer and ink in the same printing unit.

According to the present invention this is achieved with a method characterised in that the printing unit comprising a doctor blade chamber device is used for lacquer application and as a dampening unit for water application.

The printing unit for use by the method is characterised in that the lacquer application means and the water application means are comprised of a unit comprising a doctor blade chamber device and at least a roller for transferring lacquer or water from the doctor blade chamber device to the plate cylinder of the printing unit.

By using such a method and such a unit, it becomes possible to modify existing offset machines such that they find a broader use and simultaneously the process may run faster. The amount of ink or damp located in the holes on the transfer roller will be transferred to the plate cylinder either directly or via a rubber roller.

It will be possible to use separate doctor blade chamber devices for lacquer application or water application. However, it will also be possible to use one and the same doctor blade chamber device for lacquer or water application.

In a lacquering unit, which typically will be the last printing unit in an offset machine, it is advantageous that the lacquer application means comprises only one screen roller in the form of an anilox roller for transferring the lacquer applied directly from the doctor blade chamber device to the plate cylinder. This construction may be further developed. According to a special embodiment, most printing units will be provided with a support for supporting a cleaning system comprised of a liquid spraying nozzle and wiping paper. This system may be detachably mounted on the support. According to an advantageous embodiment, this support may also be used for supporting the lac-

quer application means in the form of the doctor blade chamber device and the screen roller. In such a situation, the screen roller will preferably be driven by its own motor, preferably a tacho motor. Thus, the coupling means located in the frame of the offset machine can be reused as coupling means for the unit according to the invention.

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The motor which is being used to drive the screen roller is an independent motor in order to be able to adjust the number of revolutions for different offset machines. Thus, the unit does not require a special adjustment of the drive of the screen rollers for different offset machines. In the machine, all that is required is a suspension which in its most simple form comprises four pins or screws on a support.

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By use of a unit according to the invention based on a doctor blade chamber device, it will be possible to apply strongly pigmented inks, as for example metal lacquer. This will not be possible with conventional printing units, as pigments/inks will clot and make quality printing impossible.

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The unit according to the invention may also be used as a dampening unit. In the known dampening units an environmental problem arises. To transfer the dampening water with the present roller arrangement, it is necessary to add solvents. At present, this has been prohibited in several places.

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Alternatively, attempts have been made to solve the problem by using Teflon coating to form a sort of mask so as to avoid ink setoff in certain areas. This is known as dry offset and, in principle, is a different process. Thus, Teflon may be used to replace water application from the dampening rollers. This system has an advantage as the paper is not dampened and so there is no risk of poor attachment of lacquer.

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Instead of using the traditional dampening units, according to the present invention a system comprising a doctor blade chamber device and a transfer roller may be used. According to a preferred embodiment, a screen roller and a rubber roller are used between the doctor blade chamber device and a plate cylinder. This is advantageous as it allows a faster printing than previously. The amount of water or the water bead which

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is being formed in a wedge-shaped space between the rubber roller and the plate cylinder can be varied by operating at varying speeds between the rubber roller and the plate cylinder. By operating the rubber roller at a greater speed, it is thus possible to provide a greater amount of water in the wedge. The amount of water can also be adjusted by varying the clearance of the rubber roller and the plate cylinder. The printing unit according to the invention is thus advantageous in that the amount of water located in the clearance may be varied according to need.

As a printing unit is intended either for lacquer or as dampening unit, it will be possible to use same unit comprising a doctor blade chamber device and transfer roller for both water and for lacquer.

If the plate cylinder is provided with rubber blanket, it will be possible to place cardboard under the blanket wherein a so-called window is made, i.e. an area which is cut out. Hereby, no print is made in this area. This provides the possibility of the finished image being provided with a blank space in this area, for example for a bar code or for adhesive.

By use of a conventional dampening unit, it will not be possible to apply lacquer. Because of the surface rates, there will be a substantial and unacceptable pollution of the surroundings as lacquer will splash from the periphery of the roller and from the ends of the rollers. By using the unit according to the invention as dampening unit, it will be possible to avoid pollution.

It will also be possible that two units according to the invention are provided together with the plate cylinder, of which the one unit is used for lacquer application and the other for water application. Hereby it will be possible to provide lacquer stripes and ink stripes side by side on the plate cylinder. This is made possible as doctor blade chamber devices can be divided to supply liquid/ink over a part of their length. Thus, hereby is achieved the possibility of making prints with entirely new effects.

In traditional offset machines more printing units will usually be provided. There have been a growing need and a desire to be able to employ lacquer application on the formed colour prints. Lacquer application is used as a final layer providing a lacquer layer atop the formed colour print. This lacquer application yields a better quality and a greater depth in the formed print. If it is desired to be able to apply lacquer, it has been necessary to supplement the traditional offset machines with an extra lacquering unit. The lacquering unit normally has a structure which is comparable to that of a dampening unit. This means that the lacquering unit transfers lacquer from a lacquer reservoir via a roller arrangement and a contact roller which abuts on the plate cylinder.

With the present invention it is possible to modify one or all of the desired printing units. The one or all the printing units which are not rebuilt are used for offset-printing. It is, for example, possible to modify an existing offset machine with four printing units. This may take place by modifying the last printing unit in the operating direction of the machine. The three preceding printing units then use the primary colours to make of the desired colour print. In the one or all of the modified printing units, the offset inking unit is detached from the plate cylinder. Then the dampening unit is replaced by a unit comprising a doctor blade chamber device and a screen roller which is moved into engagement with the plate cylinder. In this system, the plate cylinder will be provided with a rubber blanket which is in contact with the hard screen roller. If, at a later time, it is desired not to use lacquer application, it will be possible to demount the unit comprising the screen roller and the doctor blade chamber device and re-mount the rollers of the dampening unit.

If frequent changes are required, it will be possible to place the dampening unit and a unit comprising the screen roller/doctor blade chamber device on a slide system such that these two systems optionally may be moved into and out of engagement with the plate cylinder. By the conversion from lacquer operation to conventional inking operation and vice versa in such a printing unit, it will thus be necessary to exchange the plate on the plate cylinder as a rubber blanket is used when the lacquering unit is in

engagement, whereas conventionally a metal plate is used when the dampening unit and the inking unit are in engagement with the plate cylinder.

The invention will now be described in detail with reference to the accompanying schematic drawing, in which

Fig. 1 shows a side view of a typical offset machine comprising four printing units,

Fig. 2 shows a partial view illustrating a known printing unit comprising a dampening unit and an inking unit,

Fig. 3 shows a view corresponding to Fig. 2 illustrating a first embodiment of a printing unit according to the invention,

Fig. 4 shows a view corresponding to Fig. 2 illustrating a second embodiment of a printing unit according to the invention,

Fig. 5 shows an example of a known arrangement in a printing unit,

Fig. 6 shows a view corresponding to Fig. 5 illustrating a further embodiment of a printing unit according to the invention, and

Fig. 7 shows a view illustrating a further embodiment of a printing unit according to the invention.

Fig. 1 shows a traditional offset printing machine 1 comprising four printing units 2. The machine has a transport direction 3 for sheets being printed. The sheets come from a feeder station 4 and is transferred to a delivery station 5 by means of a feeder arrangement 6 comprising a conveyor belt 7. The conveyor belt 7 extends around two rollers 8,9. The individual sheets are transferred from the unit 4 via a track 10 around an impression cylinder 12. The individual sheets are placed at a position indicated by 13. Thus, the sheets are placed in an area between a blanket cylinder 14 and an impression cylinder 12. The blanket cylinder 14 is in contact with a plate cylinder 15. Apart from the impression cylinders 12, the offset machine also comprises transfer cylinders 16 for the sheets.

Furthermore, the offset machine comprises gripper means for holding the sheets and a plurality of rollers for dampening units and inking units which are connected to the

plate cylinder. As these are well known, they are not shown in Fig. 1 which serves to illustrate the construction of the offset unit. However, these rollers are shown in Fig. 2.

Fig. 2 shows a printing unit 1 comprising an impression cylinder 12, a blanket cylinder 14 and a plate cylinder 15. These cylinders rotate according to the arrows 17,18,19. A dampening unit comprises a container 21 for water. From the water container 21 the water is led via a system of rollers 22 to the last contact roller 23 abutting on the plate cylinder 15. Furthermore, the printing unit 1 comprises an inking unit 24 comprising a number of rollers 25 which transfer ink from an ink fountain 26 to contact rollers 27 applying the ink to a plate (not shown) located on the plate cylinder 15. Thus, the plate which is located on the plate cylinder will be supplied with ink in the areas to which no water has been applied from the dampening unit 20. The plate will usually be an etched metal plate.

As an inking unit, in principle, is constructed like the dampening unit 20, Fig. 2 can also be said to illustrate an inking unit. Thus, the ink will be fed from the container 22 containing lacquer and be transferred via rollers 22 to the last contact roller 23 also called the forme inking roller.

The shown embodiment possesses certain environmental and technical disadvantages. Instead of using the existing dampening unit, the printing unit shown in Fig. 2 can be modified as illustrated in Fig. 3.

In Fig. 3 the contact roller 23 is replaced by a unit 28 comprising a screen roller 29, preferably an anilox roller, of the kind used in flexographic printing. The screen roller 29 may be mounted directly in the existing suspension. On the screen roller 29, a doctor blade chamber device 30 is mounted. Even at large peripheral rates, the unit 28 can ensure a constant and uniform amount of water and/or lacquer being transferred to the plate cylinder 15. If it is desired to use the unit 28 for lacquer application, the rollers 27 of the inking unit are moved out of engagement with the plate cylinder 15. If the unit 28 is used for water application, the inking unit 24 is maintained in engagement with the plate cylinder 15.

In the shown embodiment, the use of the hard screen roller 29 will necessitate the use of a rubber blanket on the plate cylinder 15.

5 The shown printing unit will be very simple and easy to maintain. Simultaneously, the system will be easy to convert depending on whether it is desired to use the printing unit for one purpose or the other. Thus, according to ones wishes, it will be possible to use the existing dampening unit concurrently with the unit 28 according to the invention.

10 When the unit 28 is used for water application, it will be easy to adjust the amount of water in a simple manner. Such an adjustment of the amount of water is difficult in traditional dampening units where the rollers run synchronously with the plate cylinder 15. The screen roller 29 may be provided with its own motor driven independently of the plate cylinder. This provides the possibility of a differentiated peripheral rate and thereby the possibility of damming up larger or smaller amounts of water in the
15 wedge-shaped space 31 formed between the screen roller 29 and the plate cylinder 15.

In Fig. 4, there is shown a further embodiment of a printing unit 1 according to the invention. Fig. 4 differs from the printing unit shown in Fig. 3 in that between the unit
20 28 there is placed a further roller, viz. a rubber roller 32. By using a dampening unit constructed according to this principle, the dampening water will be transferred to the plate cylinder 15 from the doctor blade chamber device 30 via the screen roller 29 to the rubber roller 32 which will apply the dampening medium/water onto the plate cylinder 15. This arrangement is particularly advantageous with the opportunity for
25 speed variation. Thus, the peripheral rate in this embodiment may easily be varied relative to the peripheral rate on the plate cylinder with regard to varying the damp supply according to wish. In the embodiment shown in Fig. 4, the plate cylinder 15 can be used with a traditional metal plate whereto the ink is applied in the inking unit 24.

30 In Fig. 5 there is shown a known cleaning arrangement 33 to be used for a plate cylinder 15. The cleaning arrangement 33 comprises a liquid nozzle 34 which sprays a liq-

uid onto the plate cylinder and onto a wiping belt 35 extending around the roller 35'. The rollers 35' and the nozzle 34 are mounted on a support 36. The support 36 is mounted on pins 37 fastened to the frame 38 of the offset machine.

5 The arrangement 33 may be secured to the pins 37 by bolts or in another way. However, the arrangement is detachable from these pins. Thus, it will be possible to replace the shown arrangement by a unit illustrated in Fig. 6 and comprising a doctor blade chamber device 30 and a screen roller 29. The unit 28 is mounted on a supporting frame 39. The supporting frame 39 is mounted on the frame 38 of the machine via
10 the pins 37. Thus, it is easy to substitute the unit 28 for the device 33.

The roller 29 is driven by its own motor 40 by means of a belt connection or another suitable transmission connection. The motor 40 is preferably a tacho motor, such that the rotational speed can be set according to wish and adjusted to the rotational speed
15 of the plate roller 15. The unit 28 is pivotally mounted about a bearing 41, such that it may be pivoted out of and into engagement with the roller 15. The doctor blade chamber device 30 is mounted on an arm 42 via a pivotal bearing 43 such that it can be adjusted to the screen roller 29. The mutual swinging of the system may be established by means of a cylinder 44.

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Fig. 7 shows a further embodiment of a printing unit according to the invention. In this printing unit, there is a simultaneous use of two units 28. In this embodiment, there is not shown an inking unit 24 corresponding to the inking unit 24 in Figs. 2,3 and 4. However, such an inking unit will also form part of this embodiment. The unit 28 il-
25 lustrated to the right in the Figure, is used for the application of damp. The unit 28 illustrated to the left is used for the application of lacquer. As it is possible to divide the doctor blade chamber device across its length, it will be possible to apply lacquer in stripes where the dampening unit does not apply damp. Such an effect will not be possible in traditional printing units. The inking unit and the dampening unit illus-
30 trated in Fig. 7 will work according to the same principle as explained above with reference to the preceding Figures.

CLAIMS

1. A method of operation of a printing unit in an offset machine characterised in that the printing unit comprising a doctor blade chamber device is used for lacquer application and as dampening unit for water application.

2. A printing unit for use by a method according to claim 1 in an offset machine comprising means for lacquer application and means for water application, characterised in that the lacquer application means and the water application means are comprised of a unit comprising a doctor blade chamber device and at least a roller for transferring lacquer or water from the doctor blade chamber device to the plate cylinder of the printing unit.

3. A printing unit according to claim 2, characterised in that the lacquer and water application means are based on the use of one and the same doctor blade chamber device.

4. A printing unit according to claim 3, characterised in that the lacquer application means comprises only one transfer roller in the form of a screen roller transferring lacquer directly from the doctor blade chamber device to the plate cylinder.

5. A printing unit according to claim 3, characterised in that the water application means comprises transfer rollers in the form of a screen roller and a rubber roller for transferring water from the doctor blade chamber device to the plate cylinder.

6. A printing unit according to any one of the claims 2-5, characterised in that the doctor blade chamber device/transfer roller unit is displaceably mounted relative to the plate cylinder between an engagement position and an idling position.

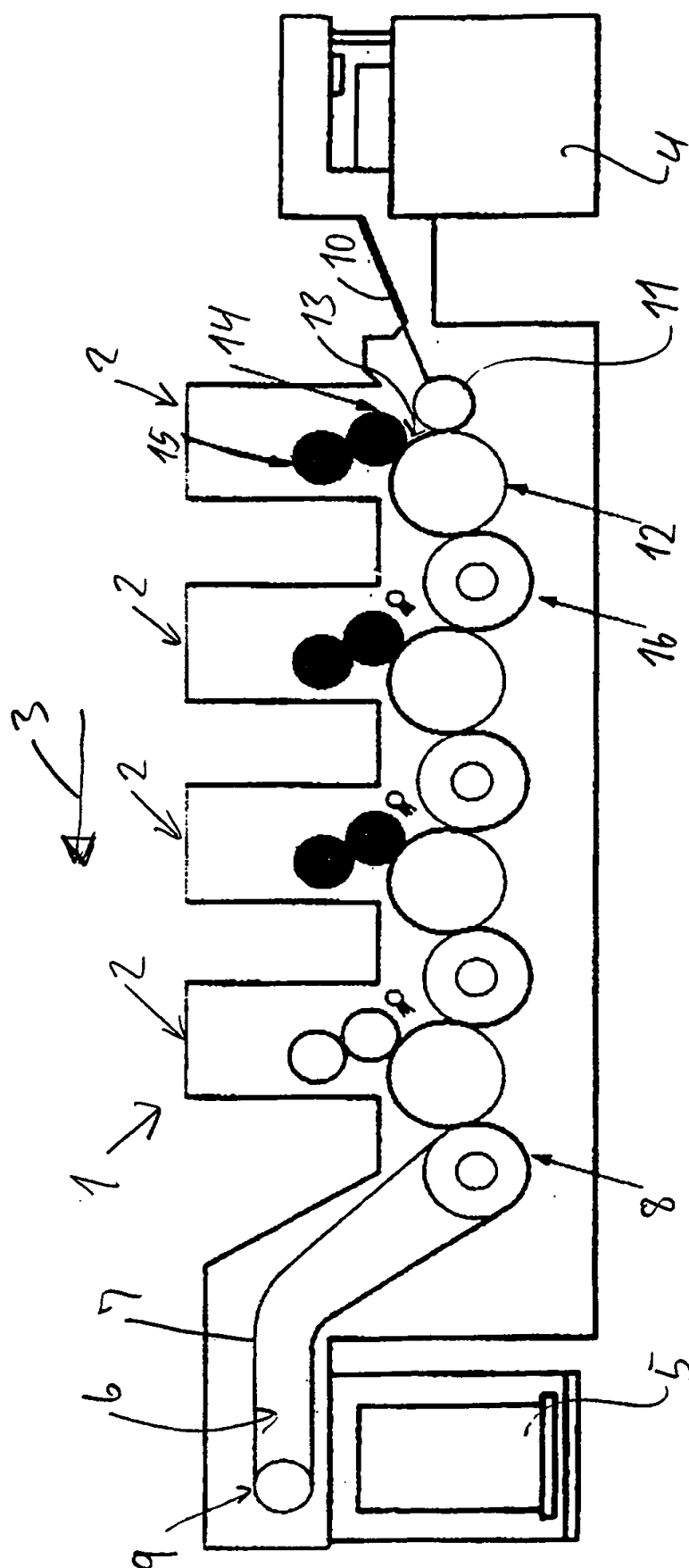
7. A printing unit according to any one of the claims 2-6, characterised in that the unit is provided with coupling means adapted to be releaseably connected to cou-

pling means in the offset machine, preferably coupling means for a cleaning unit known per se for the plate cylinder.

5 8. A printing unit according to any one of the claims 2-7, characterised in that the transfer roller is driven by its own motor, preferably via a motor controlled by tacho signal from the main machine.

10 9. A printing unit according to any one of the claims 2-8, characterised in that the unit comprising the doctor blade chamber device and at least one roller is replaceably mounted in the offset machine with the existing dampening unit of the offset machine.

15 10. A printing unit according to any one of the claims 2-9, characterised in that the transfer roller which is in contact with the plate cylinder of the printing unit is mounted in the bearing of the offset machine for a conventional transfer cylinder in a dampening unit, and that the plate cylinder simultaneously is in contact with two units comprising a doctor blade chamber device and transfer rollers for application of lacquer and water, respectively, to the plate cylinder.



15.1

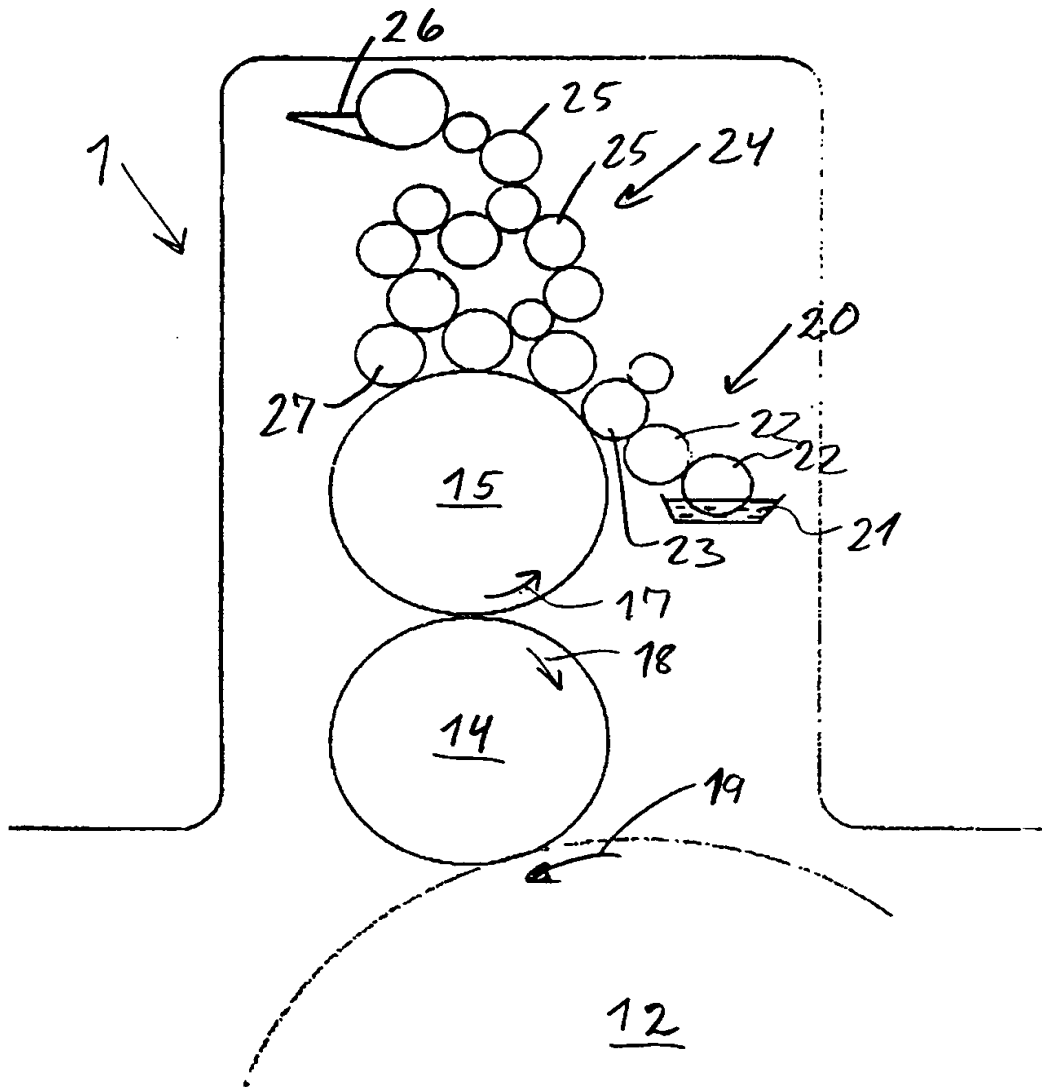


FIG. 2

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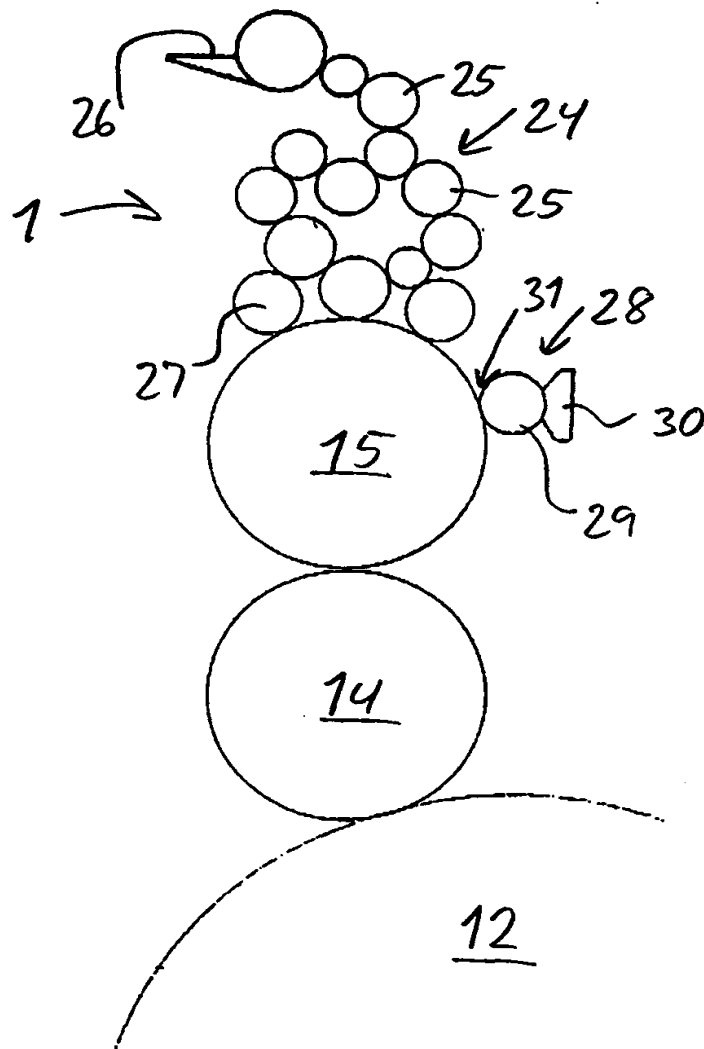


FIG. 3

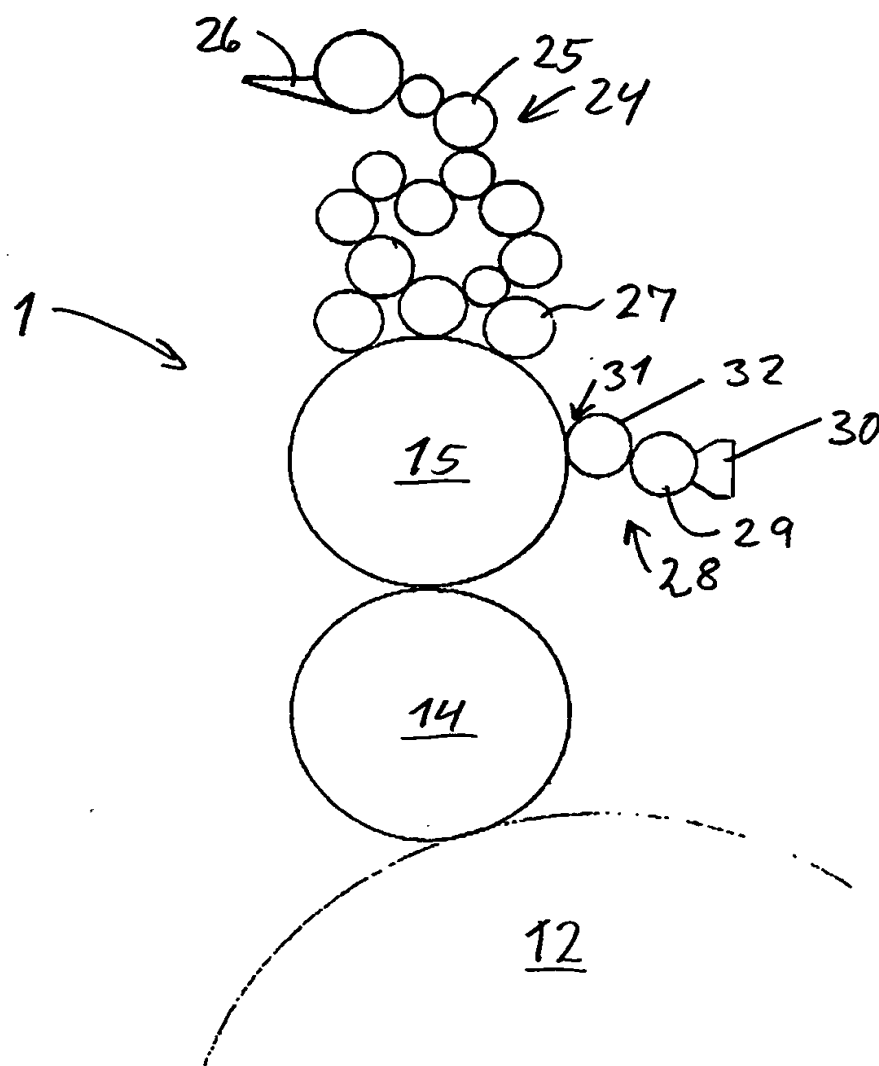


FIG. 4

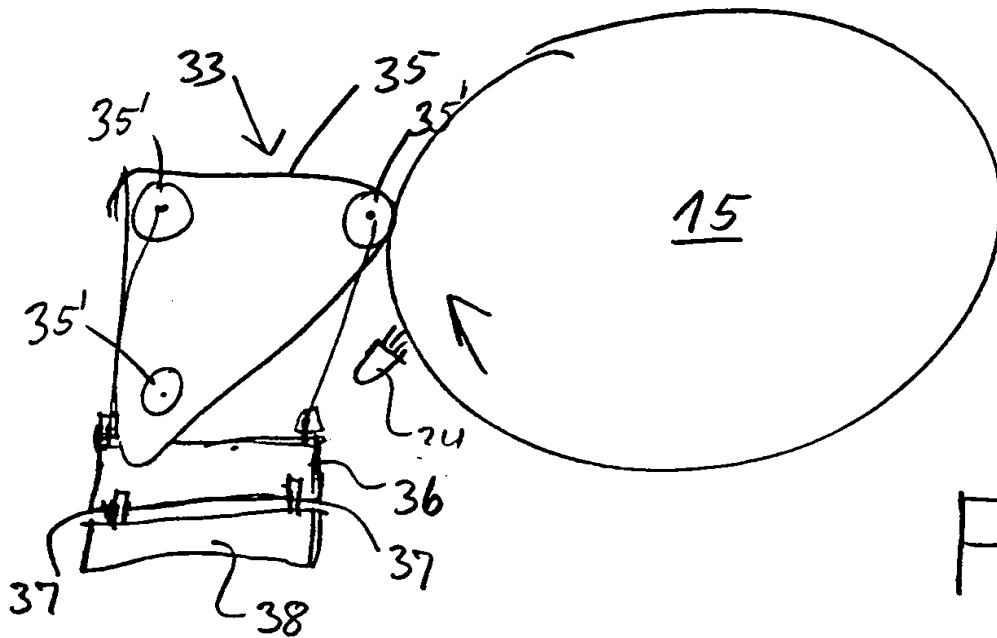


FIG. 5

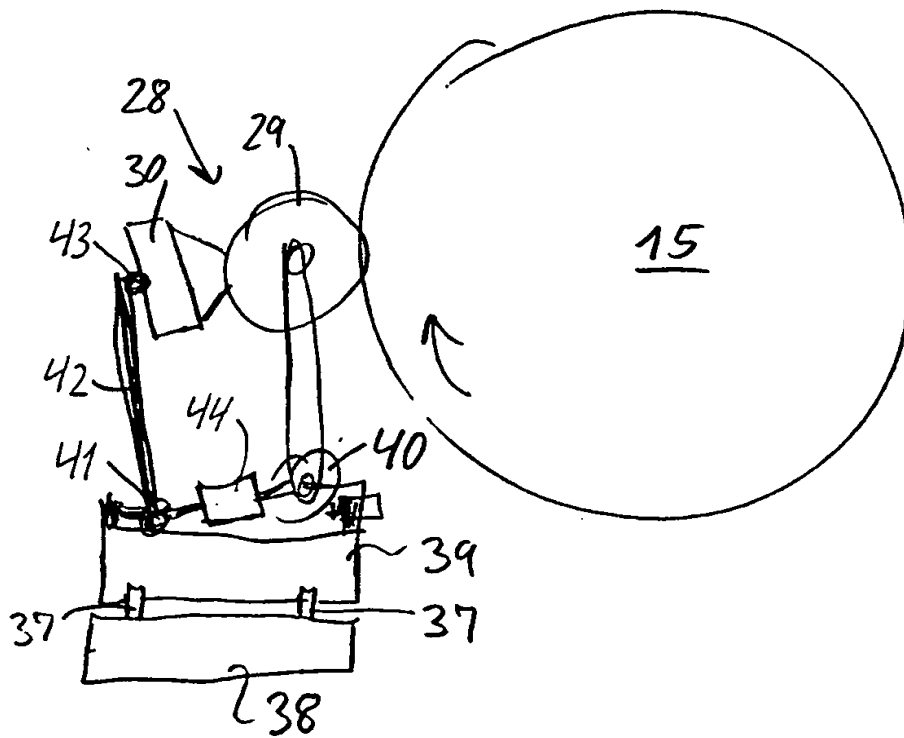


FIG. 6

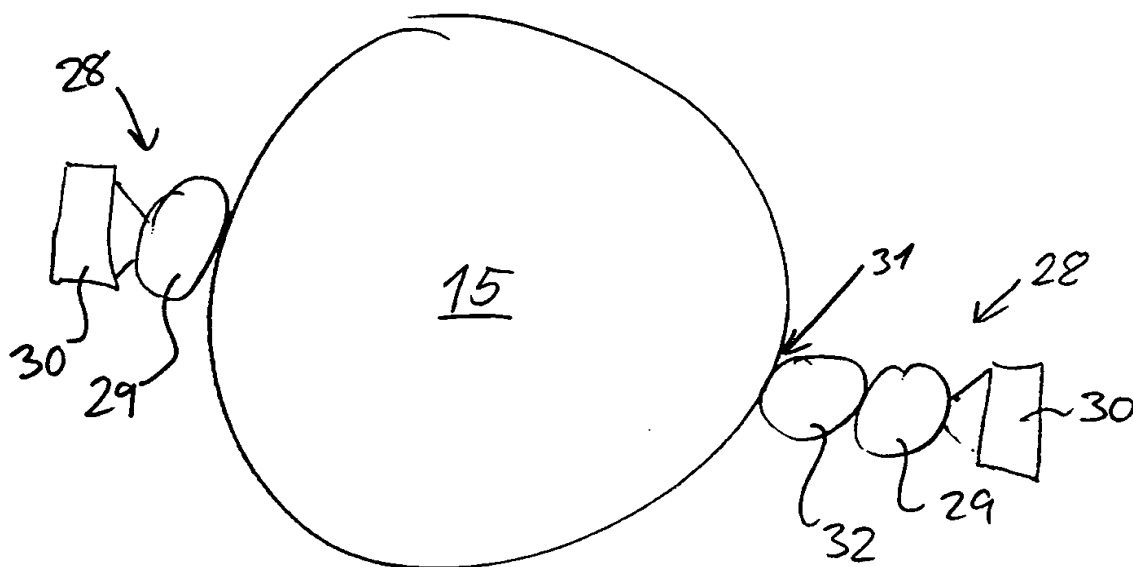


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/DK 98/00303

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: B41F 7/26, B41F 23/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: B41F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2119711 A (VEB KOMBINAT POLYGRAPH"WERNER LAMBERZ"), 23 November 1983 (23.11.83), page 1, line 88 - page 2, line 24, abstract	1-3
A	--	4-10
A	EP 0767058 A2 (DEMOORE, H.W.), 9 April 1997 (09.04.97), column 21, line 18 - line 40, figures 6,14,17, claim 2	1-10
A	EP 0659557 A1 (MAN ROLAND DRUCKMASCHINEN AG), 28 June 1995 (28.06.95), figure 2, claim 1	1-10
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Further documents are listed in the continuation of Box C.



See patent family annex.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/DK 98/00303

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0574124 A1 (DEMOORE, H.W.), 15 December 1993 (15.12.93), column 1, line 9 - line 17; column 8, line 43 - line 55, figures 1,7-9, claim 1 --	1-10
A	EP 0350839 A2 (FISCHER & KRECKE GMBH & CO.), 17 January 1990 (17.01.90), column 5, line 24 - line 43, figures 1-15 --	1-10
A	DE 3500437 A1 (VEB KOMBINAT POLYGRAPH"WERNER LAMBERZ"), 17 October 1985 (17.10.85), abstract, figure --	1-10
A	GB 2184982 A (LUIGI GHISALBERTI), 8 July 1987 (08.07.87), abstract -----	1-10

INTERNATIONAL SEARCH REPORT
Information on patent family members

27/07/98

International application No.
PCT/DK 98/00303

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2119711 A	23/11/83	DE 3305983 A,C FR 2526369 A,B JP 58191163 A	10/11/83 10/11/83 08/11/83
EP 0767058 A2	09/04/97	JP 9136398 A	27/05/97
EP 0659557 A1	28/06/95	AT 150372 T DE 4344084 C DE 59402141 D JP 7205408 A US 5588365 A	15/04/97 02/03/95 00/00/00 08/08/95 31/12/96
EP 0574124 A1	15/12/93	SE 0574124 T3 AT 148038 T AU 646197 B CA 2094694 A CN 1030047 B CN 1079689 A CZ 9300826 A DE 69307599 D,T DK 574124 T JP 2630553 B JP 7178361 A KR 9612753 B US 5207159 A US 5335596 A	15/02/97 10/02/94 07/11/93 18/10/95 22/12/93 19/01/94 12/06/97 21/07/97 16/07/97 18/07/95 24/09/96 04/05/93 09/08/94
EP 0350839 A2	17/01/90	DE 3823340 C,R JP 2117834 A	04/01/90 02/05/90
DE 3500437 A1	17/10/85	NONE	
GB 2184982 A	08/07/87	DE 3641213 A FR 2590842 A	11/06/87 05/06/87

PATENT COOPERATION TREATY

PCT

REC'D 05 OCT 1999

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 9217WO/LN/sn	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/DK98/00303	International filing date (day/month/year) 02/07/1998	Priority date (day/month/year) 03/07/1997
International Patent Classification (IPC) or national classification and IPC B41F7/26		
Applicant TRESU A/S et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 4 sheets, including this cover sheet.

- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 03/02/1999	Date of completion of this report 01.10.99
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Sartor, M Telephone No. +49 89 2399 2793 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/DK98/00303

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-9 as originally filed

Claims, No.:

1-10 as originally filed

Drawings, sheets:

1/6-6/6 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/DK98/00303

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-10
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-10
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-10
	No:	Claims	

2. Citations and explanations

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. The relevant state of the art is EP-A-574 124 (cited as A in the search report) which discloses a method of operation of a printing unit in an offset machine, wherein said printing unit comprises a doctor blade chamber device which is used for lacquer application or for ink application.
A method according to claim 1 differs from the known one in that the doctor blade chamber device which is used for lacquer application is used

(a) also as dampening unit for water application.

A method according to claim 1 is therefore new (Art. 33 (2) PCT).

The problem to be solved is to allow a broader use and a more effective operation of a printing unit in an offset machine.

None of the documents cited in the search report suggests the feature (a) of claim 1 in order to solve said problem.

A method according to claim 1 involves therefore an inventive step (Art. 33 (3) PCT).

Accordingly also a printing unit according to independent claim 2 is new and involving an inventive step.

It is to be noted that the document GB-A-2 119 711, cited in the search report as X, fails to disclose a doctor blade chamber device.

It must therefore be considered as A.

2. Dependent claims 3-10 are also new and involving an inventive step.

Re Item VII

Certain defects in the international application

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document EP-A-574 124 is not mentioned in the description, nor is this document identified therein.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/DK 98/00303

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: B41F 7/26, B41F 23/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: B41F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, PAJ, EPODOC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2119711 A (VEB KOMBINAT POLYGRAPH"WERNER LAMBERZ"), 23 November 1983 (23.11.83), page 1, line 88 - page 2, line 24, abstract	1-3
A	--	4-10
A	EP 0767058 A2 (DEMOORE, H.W.), 9 April 1997 (09.04.97), column 21, line 18 - line 40, figures 6,14,17, claim 2	1-10
A	EP 0659557 A1 (MAN ROLAND DRUCKMASCHINEN AG), 28 June 1995 (28.06.95), figure 2, claim 1	1-10

☒ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "I" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

15 October 1998

Date of mailing of the international search report

21-10-1998

Name and mailing address of the ISA:
 Swedish Patent Office
 Box 5055, S-102 42 STOCKHOLM
 Facsimile No. +46 8 666 02 86

Authorized officer

Filip von Friesendorff
 Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.

PCT/DK 98/00303

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
credit A	EP 0574124 A1 (DEMOORE, H.W.), 15 December 1993 (15.12.93), column 1, line 9 - line 17; column 8, line 43 - line 55, figures 1,7-9, claim 1 --	1-10
credit A	EP 0350839 A2 (FISCHER & KRECKE GMBH & CO.), 17 January 1990 (17.01.90), column 5, line 24 - line 43, figures 1-15 --	1-10
A	DE 3500437 A1 (VEB KOMBINAT POLYGRAPH"WERNER LAMBERZ"), 17 October 1985 (17.10.85), abstract, figure --	1-10
A	GB 2184982 A (LUIGI GHISALBERTI), 8 July 1987 (08.07.87), abstract -- -----	1-10

INTERNATIONAL SEARCH REPORT
Information on patent family members

27/07/98

International application No.
PCT/DK 98/00303

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2119711 A	23/11/83	DE 3305983 A,C FR 2526369 A,B JP 58191163 A	10/11/83 10/11/83 08/11/83
EP 0767058 A2	09/04/97	JP 9136398 A	27/05/97
EP 0659557 A1	28/06/95	AT 150372 T DE 4344084 C DE 59402141 D JP 7205408 A US 5588365 A	15/04/97 02/03/95 00/00/00 08/08/95 31/12/96
EP 0574124 A1	15/12/93	SE 0574124 T3 AT 148038 T AU 646197 B CA 2094694 A CN 1030047 B CN 1079689 A CZ 9300826 A DE 69307599 D,T DK 574124 T JP 2630553 B JP 7178361 A KR 9612753 B US 5207159 A US 5335596 A	15/02/97 10/02/94 07/11/93 18/10/95 22/12/93 19/01/94 12/06/97 21/07/97 16/07/97 18/07/95 24/09/96 04/05/93 09/08/94
EP 0350839 A2	17/01/90	DE 3823340 C,R JP 2117834 A	04/01/90 02/05/90
DE 3500437 A1	17/10/85	NONE	
GB 2184982 A	08/07/87	DE 3641213 A FR 2590842 A	11/06/87 05/06/87

- 3 JULI 1998

PCT

FAXED TO

NO.: 43,50 8001

PAGES 25

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

CONFIRMATION COPY

For receiving Office use only

International Application No. PCT/DK 98 / 00303

02 JULY 1998

International Filing Date

Patentdirektoratet

Danish Patent Office

Name of receiving Office and PCT International Application

Applicant's or agent's file reference

(if desired) (12 characters maximum) 9217W0/LN/sn

Box No. I TITLE OF INVENTION	
Method of operation of a Brinting Unit and Printing Unit for Offset-machine	
Box No. II APPLICANT	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)	
TRESU A/S EEGSVEJ 14-16 DK-6091 BJERT DENMARK	<input type="checkbox"/> This person is also inventor. Telephone No. Facsimile No. Teleprinter No.
State (that is, country) of nationality: DK	State (that is, country) of residence: DK
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input checked="" type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)	
LEIMAND, HENRIK ENGDRAGET 18 DK-6091 BJERT DENMARK	This person is: <input type="checkbox"/> applicant only <input checked="" type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)
State (that is, country) of nationality: DK	State (that is, country) of residence: DK
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
<input type="checkbox"/> Further applicants and/or (further) inventors are indicated on a continuation sheet.	
Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE	
The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: <input checked="" type="checkbox"/> agent <input type="checkbox"/> common representative	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	
PATRADE A/S STORE TORV 1 DK-8000 ÅRHUS C DENMARK	Telephone No. + 45 87 30 37 00 Facsimile No. + 45 87 30 37 01 Teleprinter No.
<input type="checkbox"/> Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.	

CONFIRMATION COPY

Box No.V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

Regional Patent

- ☒ **AP ARIPO Patent:** GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SZ Swaziland, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ **EA Eurasian Patent:** AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP European Patent:** AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ **OA OAPI Patent:** BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line):

- | | |
|--|--|
| <input checked="" type="checkbox"/> AL Albania | <input checked="" type="checkbox"/> LS Lesotho |
| <input checked="" type="checkbox"/> AM Armenia | <input checked="" type="checkbox"/> LT Lithuania |
| <input checked="" type="checkbox"/> AT Austria and utility model | <input checked="" type="checkbox"/> LU Luxembourg |
| <input checked="" type="checkbox"/> AU Australia | <input checked="" type="checkbox"/> LV Latvia |
| <input checked="" type="checkbox"/> AZ Azerbaijan | <input checked="" type="checkbox"/> MD Republic of Moldova |
| <input checked="" type="checkbox"/> BA Bosnia and Herzegovina | <input checked="" type="checkbox"/> MG Madagascar |
| <input checked="" type="checkbox"/> BB Barbados | <input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia ... |
| <input checked="" type="checkbox"/> BG Bulgaria | <input checked="" type="checkbox"/> MN Mongolia |
| <input checked="" type="checkbox"/> BR Brazil | <input checked="" type="checkbox"/> MW Malawi |
| <input checked="" type="checkbox"/> BY Belarus | <input checked="" type="checkbox"/> MX Mexico |
| <input checked="" type="checkbox"/> CA Canada | <input checked="" type="checkbox"/> NO Norway |
| <input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein | <input checked="" type="checkbox"/> NZ New Zealand |
| <input checked="" type="checkbox"/> CN China | <input checked="" type="checkbox"/> PL Poland |
| <input checked="" type="checkbox"/> CU Cuba | <input checked="" type="checkbox"/> PT Portugal |
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| <input checked="" type="checkbox"/> DE Germany and utility model | <input checked="" type="checkbox"/> RU Russian Federation |
| <input checked="" type="checkbox"/> DK Denmark and utility model | <input checked="" type="checkbox"/> SD Sudan |
| <input checked="" type="checkbox"/> EE Estonia and utility model | <input checked="" type="checkbox"/> SE Sweden |
| <input checked="" type="checkbox"/> ES Spain | <input checked="" type="checkbox"/> SG Singapore |
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| <input checked="" type="checkbox"/> GM Gambia | <input checked="" type="checkbox"/> TM Turkmenistan |
| <input checked="" type="checkbox"/> GW Guinea-Bissau | <input checked="" type="checkbox"/> TR Turkey |
| <input checked="" type="checkbox"/> HR Croatia | <input checked="" type="checkbox"/> TT Trinidad and Tobago |
| <input checked="" type="checkbox"/> HU Hungary | <input checked="" type="checkbox"/> UA Ukraine |
| <input checked="" type="checkbox"/> ID Indonesia | <input checked="" type="checkbox"/> UG Uganda |
| <input checked="" type="checkbox"/> IL Israel | <input checked="" type="checkbox"/> US United States of America |
| <input checked="" type="checkbox"/> IS Iceland | <input checked="" type="checkbox"/> UZ Uzbekistan |
| <input checked="" type="checkbox"/> JP Japan | <input checked="" type="checkbox"/> VN Viet Nam |
| <input checked="" type="checkbox"/> KE Kenya | <input checked="" type="checkbox"/> YU Yugoslavia |
| <input checked="" type="checkbox"/> KG Kyrgyzstan | <input checked="" type="checkbox"/> ZW Zimbabwe |
| <input checked="" type="checkbox"/> KP Democratic People's Republic of Korea | |
| <input checked="" type="checkbox"/> KR Republic of Korea | |
| <input checked="" type="checkbox"/> KZ Kazakhstan | |
| <input checked="" type="checkbox"/> LC Saint Lucia | |
| <input checked="" type="checkbox"/> LK Sri Lanka | |
| <input checked="" type="checkbox"/> LR Liberia | |

Check-boxes reserved for designating States (for the purposes of a national patent) which have become party to the PCT after issuance of this sheet:

- ☐
- ☐

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)

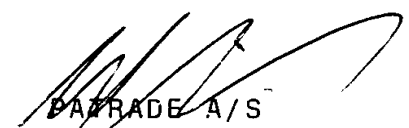
Box No. VI PRIORITY CLAIM					<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:					
		national application: country	regional application: regional Office	international application: receiving Office			
item (1) (03.07.1997) 3rd. July 1997	0800/97	DK					
item (2)							
item (3)							

☒ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s): (1)

* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

Box No. VII INTERNATIONAL SEARCHING AUTHORITY			
Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used): ISA / SE		Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):	
		Date (day/month/year)	Number Country (or regional Office)

Box No. VIII CHECK LIST; LANGUAGE OF FILING	
This international application contains the following number of sheets: request : 3 description (excluding sequence listing part) : 9 claims : 2 abstract : 1 drawings : 6 sequence listing part of description : Total number of sheets : 21	This international application is accompanied by the item(s) marked below: 1. <input checked="" type="checkbox"/> fee calculation sheet 2. <input type="checkbox"/> separate signed power of attorney 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: 4. <input type="checkbox"/> statement explaining lack of signature 5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input checked="" type="checkbox"/> other (specify): Copy of off. letter of 01.05.1998
Figure of the drawings which should accompany the abstract: 1, 3 and 4	Language of filing of the international application: Danish

Box No. IX SIGNATURE OF APPLICANT OR AGENT	
Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).	
 BARRADE A/S	

For receiving Office use only		2. Drawings: <input type="checkbox"/> received: <input type="checkbox"/> not received:
1. Date of actual receipt of the purported international application:	RO/DK 02 JUL 1998 (02.07.98)	
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA / SE	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.	

For International Bureau use only	
Date of receipt of the record copy by the International Bureau:	24 JULY 1998 (24.07.98)

FREMGANGSMÅDE TIL DRIFT AF ET TRYKVÆRK SAMT TRYKVÆRK TIL OFFSETMASKINE.

Den foreliggende opfindelse angår en fremgangsmåde til drift af et trykværk samt et trykværk til brug i en offsetmaskine, der omfatter organer til lakpåføring samt organer til vandpåføring.

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Offsetmaskiner er velkendte inden for faget og vil derfor kun blive beskrevet kort. En bane eller et ark, hvorpå der skal trykkes, føres omkring trykvalser eller overføringsvalser. Banen eller arkene bringes i anlæg mod en blanket cylinder for at få påført det tryk, som skal påføres i det enkelte trykværk i offsetmaskinen. Blanket cylinderen er i kontakt med en plate-cylinder, som overfører det farvetryk, som skal placeres på banen. Plate-cylinderen er i kontakt med fugteværk samt et farveværk, som påfører fugt henholdsvis farve. Således vil en offsetplade på plate-cylinderen roteres, hvorved vandmodtagende dele fugtes af fugteværkets valser. Derefter vil de farvemodtagelige dele af offsetpladen forsynes med farve fra farvevalserne i farveværket. Det dannede trykbillede afsættes derefter på blanket cylinderen, der videretrykker farven på banen eller arket. Der vil fortrinsvis være tale om en papirbane, men der kan også trykkes på andre materialer.

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Et trykværk ifølge den foreliggende opfindelse kan anvendes i en traditionel offsetmaskine, for eksempel af den type, der er beskrevet i europæisk patentansøgning nr. 767.058. Indholdet af denne patentansøgning er herved inkorporeret ved reference, idet trykværket kan være en del af en offsetmaskine, som er opbygget efter samme princip og med samme papirafgivnings- og papirmodtagningsorganer ved begyndelsen og slutningen af trykværket, ligesom der kan anvendes tilsvarende organer til overføring af papirbane eller enkeltark imellem forskellige trykværker, der placeres i rækkefølge for at bibringe banen det færdige tryk. Der vil ligeledes kunne anvendes samme type trykfarver. Offsetmaskiner kan være udrustet med et lakværk. Lakværket vil typisk være opbygget med en plate cylinder, hvorpå lakken bliver påført fra et valsearrangement, der forsynes fra et kar med klar lak.

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Det er formålet med den foreliggende opfindelse at anvise en fremgangsmåde til drift af et trykværk samt et trykværk til en offsetmaskine, som muliggør en bredere anvendelse og en mere effektiv drift af trykværker i eksisterende offsetmaskiner. Det er endvidere et formål at anvise et trykværk, der samtidig kan benyttes til lak- og farvepåføring i samme trykværk.

Ifølge den foreliggende opfindelse opnås dette med en fremgangsmåde, som er særpræget ved, at trykværket omfattende en kammerrakel anvendes til lakpåføring og som fugteværk til vandpåføring.

Trykværket til brug ved fremgangsmåden er særpræget ved, at lakpåføringsorganerne og vandpåføringsorganerne udgøres af en enhed, der omfatter en kammerrakel samt i det mindste en valse til overføring af lak eller vand fra kammerraklen til trykværkets plate-cylinder.

Ved at anvende en sådan fremgangsmåde og en sådan enhed bliver det muligt at foretage en modifikation af eksisterende offsetmaskiner, således at de får en bredere anvendelse, og samtidig kan processen køre hurtigere. Den farvemængde eller det fugt, som ligger i hulleerne på overføringsvalsen, vil blive overført til plate-cylinderen enten direkte eller via en gummivalse.

Det vil være muligt at anvende separate kammerrakler til lakpåføring og vandpåføring. Imidlertid vil det også være muligt at anvende en og samme kammerrakel til lak- og vandpåføring.

I et lakværk, som typisk vil være det sidste trykværk i en offsetmaskine, er det fordelagtigt, at lakpåføringsorganerne kun omfatter én rastervalse, i form af en Anilox-valse, til overføring af lakken, som påføres direkte fra kammerraklen til plate-cylinderen. Denne udformning kan videreudvikles. Ifølge en speciel udførelsesform vil de fleste trykværker være forsynet med et stativ til understøtning af et rengøringsystem af en væskepåsprøjtningssdyse samt aftørningspapir. Dette system kan monteres aftageligt på stativet. Ifølge en fordelagtig udførelsesform kan dette stativ også benyttes til under-

støtning af lakpåføringsorganerne i form af kammerraklen og rastervalsen. Rastervalsen vil i en sådan situation fortrinsvis blive drevet af sin egen motor, fortrinsvis en tachomotor. De koblingsorganer, som befinder sig i offsetmaskinens ramme, vil således genbruges som koblingsorganer for enheden ifølge opfindelsen.

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Motoren, som benyttes til at trække rastervalsen, vil være selvstændig for at kunne tilpasse omdrejningstallet til forskellige offsetmaskiner. Enheden behøver således ikke en speciel tilpasning af rastervalsens træk til forskellige offsetmaskiner. I maskinen vil der kun være behov for et ophæng, som i sin mest simple form består af fire tappe eller skruer på et stativ.

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Ved anvendelse af en enhed ifølge opfindelsen, der er baseret på et kammerrakel, vil det være muligt at påføre stærkt pigmenterede farver, som for eksempel metallakker. Dette vil ikke være muligt med almindelige trykværker, idet pigmenter/farver her vil klumpe sammen og umuliggøre dannelsen af et kvalitetstryk.

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Enheden ifølge opfindelsen kan også anvendes som et fugteværk. I de kendte fugteværker opstår der et miljøproblem. For at kunne overføre fugte vandet med det nuværende valsearrangement er det nødvendigt at tilsætte opløsningsmidler. Dette er på nuværende tidspunkt blevet forbudt flere steder.

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Alternativt har man forsøgt at løse problemet ved teflonbelægning for at danne en slags maske med henblik på at undgå farveafsætning i visse områder. Dette er kendt som tøroffset og er en principielt forskellig proces. Man har således benyttet teflon til at erstatte vandpåføringen fra fugte valserne. Dette system har en fordel, idet papiret ikke fugtes og derved opstår der ikke risiko for at lak vedhæfter på dårlig måde.

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I stedet for at anvende de traditionelle fugteværker kan der ifølge den foreliggende opfindelse anvendes et system, der omfatter en kammerrakel samt en overføringsvalse. Ifølge en foretrukket udførelsesform anvendes der en rastervalse samt en gummivalse imellem kammerraklen og plate-cylinderen. Dette er fordelagtigt, idet man kan køre hurtigere end hidtil. Den vandmængde eller vandpølse, som dannes i et kileformet

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mellemrum mellem gummivalser og plate-cylinderen kan varieres ved at køre med varieret hastighed mellem gummivalser og plate-cylinderen. Ved at køre med en større hastighed på gummivalser er det således muligt at tilvejebringe en større vandmængde i kilen. Vandmængden kan tillige justeres ved at variere den spaltebredde, som optræder mellem gummivalser og plate-cylinderen. Trykværket ifølge opfindelsen er således fordelagtig ved, at vandmængden, som befinder sig i spalten, kan varieres efter behov.

Idet et trykværk enten vil være beregnet til lak eller til fugteværk, vil det være muligt at anvende samme enhed bestående af kammerrakel og overføringsvalse både til vand og til lak.

Hvis platecylinderen er forsynet med gummidug vil det være muligt at indlægge pap under gummidugen, hvori der laves et såkaldt vindue, det vil sige et område, der udskares. Herved vil der ikke laves noget tryk i dette område. Dette skaber mulighed for, at det færdige tryk i dette område kan være forsynet med et felt for eksempel til en stregkode eller til lim.

Ved anvendelse af et almindeligt fugteværk vil det ikke være muligt at påføre lak. På grund af overfladehastighederne vil der optræde stor og utilladelig forurening af omgivelserne, idet lak vil sprøjte ud fra valsens periferi samt ud fra enderne af valserne. Ved at anvende enheden ifølge opfindelsen som fugteværk vil det være muligt at undgå forureninger.

Det vil også være muligt at der sammen med en plate-cylinder er tilvejebragt to enheder ifølge opfindelsen, hvoraf den ene enhed benyttes til lakpåføring og den anden til vandpåføring. Herved vil det være muligt at tilvejebringe lakstriber og farvestriber side om side på plate-cylinderen. Dette er muliggjort, da kammerrakler kan opdeles for at afgive væske/farve over en del af deres længde. Herved opnås således mulighed for at lave tryk med helt nyt effekter.

I traditionelle offsetmaskiner vil der almindeligvis være tilvejebragt flere trykværker. Det har været et voksende behov og ønske om at kunne anvende lakpåføring på de dannede farvetryk. Lakpåføringen anvendes som et sidste lag, som giver et laklag ovenpå det dannede farvetryk. Denne lakpåføring giver en bedre kvalitet og en større dybde i det dannede tryk. Hvis man ønsker at kunne påføre en lak, har det i de traditionelle offsetmaskiner været nødvendigt at supplere disse med et ekstra lakværk. Lakværket har almindeligvis en opbygning, som kan sammenlignes med et fugteværk. Det vil sige, at lakværket overfører lak fra et lakreservoir via et valsearrangement og en kontaktvalse, som er i anlæg mod plate-cylindren.

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Med den foreliggende opfindelse er det muligt at modificere det ønskede trykværk eller flere. Det eller de trykværker, der ikke ombygges, anvendes til offsettrykning. Det er for eksempel muligt at modificere en eksisterende offsetmaskine med fire trykværk. Dette kan ske ved at modificere det sidste trykværk i maskinens arbejdsretning. De tre foregående trykværker benytter derefter grundfarverne til dannelse af det ønskede farvetryk. I det eller de modificerede trykværker frakobles offsetfarveværket fra plate-cylindren. Derefter erstattes fugteværket med en enhed omfattende kammerraklen og en rastervalse, som bringes i indgreb med plate-cylindren. Plate-cylindren vil i dette system forsynes med en gummidug, som er i kontakt med den hårde rastervalse. Såfremt man på et senere tidspunkt ikke ønsker at anvende lakpåførsel, vil det være muligt at afmontere enheden omfattende rastervalsen og kammerraklen og igen montere fugteværkets valser.

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Såfremt der skal foretages hyppige skift, vil det være muligt at placere et fugteværk og en enhed omfattende rastervalsen/kammerraklen på et slædesystem, således at disse to systemer valgfrit kan bringes ud og ind af indgreb med plate-cylindren. Ved omskiftningen imellem lakkørsel og almindelig farvekørsel i et sådant trykværk vil det da være nødvendigt at udskifte klicheen på plate-cylindren, idet der anvendes en gummidug, når lakværket er i indgreb, hvorimod der almindeligvis anvendes en metalkliche, når fugteværket og farveværket er i indgreb med plate-cylindren.

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Opfindelsen vil i det efterfølgende blive forklaret under henvisning til den medfølgende skematiske tegning, hvor

- fig. 1 viser et sidebillede af en typisk offsetmaskine omfattende fire trykværker,
- 5 fig. 2 viser et partielt billede til illustration af et kendt trykværk, der omfatter et fugteværk samt et farveværk,
- fig. 3 viser et billede svarende til fig. 2 til illustration af en første udførelsesform for et trykværk ifølge opfindelsen,
- fig. 4 viser et billede svarende til fig. 2 til illustration af en anden udførelsesform
10 for et tryk ifølge opfindelsen,
- fig. 5 viser et eksempel på et kendt arrangement i et trykværk,
- fig. 6 viser et billede svarende til fig. 5 til illustration af en yderligere udførelsesform for et trykværk ifølge opfindelsen, og
- fig. 7 viser et billede til illustration af en yderligere udførelsesform for et trykværk
15 ifølge opfindelsen.

Fig. 1 viser en traditionel offsettrykkemaskine 1, som omfatter fire trykværker 2. Maskinen har en transportretning 3 for ark, som trykkes. Arkene kommer fra en afgivningsstation 4 og føres til en modtagestation 5 ved hjælp af et afgivningsarrangement
20 6, som omfatter et transportbånd 7. Transportbåndet 7 løber omkring to valser 8,9. De enkelte ark føres fra enheden 4 via en bane 10 omkring en impressionscylinder eller modtrykscylinder 12. De enkelte ark placeres ved en position, som er indikeret ved 13. Arkene er således placeret i et område mellem en blanket cylinder 14 og impressionscylinderen 12. Blanket cylinderen 14 er i kontakt med en platecylinder 15. Udover
25 impressionscylindrene 12 omfatter offsetmaskinen også overføringscylindre 16 for arkene.

Offsetmaskinen omfatter endvidere gribeorganer til fastholdelse af ark samt en lang række valser til fugteværker og farveværker, som er i forbindelse med platecylinderen. Da disse er velkendte, er de ikke vist i fig. 1, der tjener til illustration af
30 offsetværkets opbygning. Disse valser fremgår derimod af fig. 2.

Fig. 2 viser et trykværk 1, som omfatter en impressioncylinder 12, en blanket cylinder 14 og en plate-cylinder 15. Disse cylindre roterer ifølge pilene 17,18,19. Et fugteværk omfatter en beholder 21 for vand. Fra vandbeholderen 21 føres vandet via et system af valser 22 til den sidste kontaktvalse 23, som er i anlæg mod plate-cylinderen 15. Trykværket 1 omfatter endvidere et farveværk 24, der omfatter et antal valser 25, som overfører farve fra en farvebeholder 26 til kontaktvalser 27, som påfører farven på en kliche (ikke vist), som befinder sig på plate-cylinderen 15. Den kliche, som befinder sig på plate-cylinderen, vil således blive bibragt farve i de områder, hvor der ikke er påført vand fra fugteværket 20. Klichen vil almindeligvis være en ætset metalplade.

Da et lakværk i princippet er opbygget som fugteværket 20 kan fig. 2 også siges at illustrere et lakværk. Lakken vil således føres op fra beholderen 22, som indeholder lak, og overføres via valser 22 til den sidste kontaktvalse 23, der også kaldes formevalsen.

Den viste udformning har nogle miljømæssige samt tryktekniske ulemper. I stedet for at anvende det bestående fugteværk kan det i fig. 2 viste trykværk modificeres, således som illustreret i fig. 3.

I fig. 3 er kontaktvalsen 23 erstattet af en enhed 28, som omfatter en rastervalse 29, fortrinsvis en Aniloxvalse, af den type, som også anvendes til flexografisk trykning. Rastervalsen 29 kan monteres direkte i det bestående ophæng. På rastervalsen 29 monteres et kammerrakelsystem 30. Enheden 28 kan selv ved store periferihastigheder sikre en konstant og ens mængde vand og/eller lak overført til plate-cylinderen 15. Såfremt man ønsker at anvende enheden 28 til lakpåføring, bringes farveværkets valser 27 ud af indgreb med plate-cylinderen 15. Såfremt enheden 28 benyttes til vandpåføring bibeholdes farveværket 24 indkoblet med plate-cylinderen 15.

I den viste udformning vil anvendelsen af den hårde rastervalse 29 nødvendiggøre anvendelsen af en gummidug på plate-cylinderen 15.

Det viste trykværk vil være meget enkelt og let at vedligeholde. Samtidig vil systemet være let at udskifte afhængigt af om trykværket ønskes brugt til det ene eller andet formål. Det vil således være muligt efter ønske at anvende det bestående fugteværk sideløbende med enheden 28 ifølge opfindelsen.

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Når enheden 28 benyttes til vandpåføring, vil det på enkelt måde være let at justere vandmængden. En sådan justering af vandmængden er vanskelig i traditionelle fugteværker, hvor valserne kører synkront med plate-cylindren 15. Rastervalsen 29 kan være forsynet med sin egen motor, der drives uafhængig af plate-cylindren. Dette skaber mulighed for en differentieret periferihastighed og dermed mulighed for opstemning af større eller mindre mængde vand i det kileformede mellemrum 31, som dannes mellem rastervalsen 29 og plate-cylindren 15.

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I fig. 4 vises en yderligere udførelsesform for et trykværk 1 ifølge opfindelsen. Fig. 4 adskiller sig fra det i fig. 3 viste trykværk ved, at der mellem enheden 28 er placeret en yderligere valse, nemlig en gummivalse 32. Ved anvendelsen af et fugteværk opbygget efter dette princip vil fugtevandet overføres til plate-cylindren 15 fra kammerraklen 30 via rastervalsen 29 til gummivalserne 32, som vil afsætte fugtemediet/vandet på plate-cylindren 15. Dette arrangement er særligt fordelagtigt ved mulighed for hastighedsvariation. Således vil periferihastighed i denne udførelsesform let kunne varieres i forhold til periferihastigheden på plate-cylindren med henblik på at variere fugttilførslen afhængigt af ønske. I den udførelsesform, som er vist i fig. 4, vil plate-cylindren 15 kunne anvendes med en traditionel metalkliche, hvor farven påføres i farveværket 24.

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I fig. 5 ses et kendt rengøringsarrangement 33 til brug for en plate-cylinder 15. Rengøringsarrangementet 33 omfatter en væskedyse 34, som påsprøjte en væske på plate-cylindren, samt et aftørningsbånd 35, der løber omkring valser 35'. Valserne 35' samt dysen 34 er monteret på et stativ 36. Stativet 36 er monteret på tappe 37, som er fastgjort til offsetmaskinens ramme 38.

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Arrangementet 33 kan være fastgjort til tappene 37 ved fastboltning eller på anden måde. Imidlertid er arrangementet aftageligt fra disse tappe. Det vil derfor være muligt at erstatte det viste arrangement med en enhed, der er illustreret i fig. 6, og som omfatter et kammerrakel 30 samt en rastervalse 29. Enheden 28 er monteret på en understøtningsramme 39. Understøtningsrammen 39 er monteret på maskinens ramme 38 via tappene 37. Det er således let at udskifte arrangementet 33 med enheden 28.

Valsen 29 drives af sin egen motor 40 ved hjælp af en remforbindelse eller en anden hensigtsmæssig transmissionsforbindelse. Motoren 40 er fortrinsvis en tachomotor, således at omdrejningshastigheden kan indstilles efter ønske og tilpasses den omdrejningshastighed, der er på plate valsen 15. Enheden 28 er anbragt svingbart lejret om en lejring 41, således at det kan svinges ud og ind af indgreb med valsen 15. Kammerraklen 30 er monteret på en arm 42 via en drejelig lejring 43, således at den kan indstille sig til rastervalsen 29. Den indbyrdes svingning af systemet kan etableres ved hjælp af en cylinder 44.

Fig. 7 viser en yderligere udførelsesform for et trykværk ifølge opfindelsen. I dette trykværk er der en samtidig anvendelse af to enheder 28. I denne udførelsesform er der ikke illustreret et farveværk 24 svarende til farveværket 24 i fig. 2,3 og 4. Imidlertid vil et sådant farveværk også indgå i denne udførelsesform. Enheden 28, som er illustreret til højre i figuren, anvendes til påføring af fugt. Enheden 28, der er vist til venstre, anvendes til påføring af lak. Da det er muligt at opdele kammerraklen over dens længde, vil det være muligt at påføre lak i striber, hvor fugteværket ikke påfører fugt. En sådan effekt vil ikke være mulig i traditionelle trykværker. Lakværket og fugteværket, som er illustreret i fig. 7, vil fungere efter samme princip som forklaret ovenfor under henvisning til de foregående figurer.

PATENTKRAV

1. Fremgangsmåde til drift af et trykværk i en offsetmaskine, *k e n d e t e g n e t* ved, at trykværket omfattende en kammerrakel anvendes til lakpåføring og som fugteværk
5 til vandpåføring.
2. Trykværk til brug ved en fremgangsmåde ifølge krav 1 i en offsetmaskine, der omfatter organer til lakpåføring samt organer til vandpåføring, *k e n d e t e g n e t* ved, at lakpåføringsorganerne og vandpåføringsorganerne udgøres af en enhed, der omfatter
10 en kammerrakel samt i det mindste en valse til overføring af lak eller vand fra kammerraklen til trykværkets plate-cylinder.
3. Trykværk ifølge krav 2, *k e n d e t e g n e t* ved, at lak- og vandpåføringsorganerne er baseret på anvendelse af en og samme kammerrakel.
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4. Trykværk ifølge krav 3, *k e n d e t e g n e t* ved, at lakpåføringsorganerne kun omfatter én overføringsvalse i form af en rastervalse, der overfører lak direkte fra kammerraklen til platecylinderen.
- 20 5. Trykværk ifølge krav 3, *k e n d e t e g n e t* ved, at vandpåføringsorganerne omfatter overføringsvalser i form af en rastervalse og en gummivalse til overføring af vand fra kammerraklen til platecylinderen.
6. Trykværk ifølge et hvilket som helst af kravene 2-5, *k e n d e t e g n e t* ved, at
25 kammerrakel/overføringsvalse-enheden er monteret forskydeligt i forhold til platecylinderen mellem en indgrebsstilling og en udkoblingsstilling.
7. Trykværk ifølge et hvilket som helst af kravene 2-6, *k e n d e t e g n e t* ved, at enheden er forsynet med koblingsorganer, der er indrettet til at blive forbundet udløseligt
30 med koblingsorganer i offsetmaskinen, fortrinsvis koblingsorganer for et i sig selv kendt renseenhed for platecylinderen.

8. Trykværk ifølge et hvilket som helst af kravene 2-7, k e n d e t e g n e t ved, at overføringsvalsen er drevet af sin egen motor, fortrinsvis via en motor, der er styret af tachosignal fra hovedmaskinen.
- 5
- 9: Trykværk ifølge et hvilket som helst af kravene 2-8, k e n d e t e g n e t ved, at enheden omfattende kammerraklen samt den mindst ene valse er monteret i offsetmaskinen på udskiftelig måde med offsetmaskinens bestående fugteværk.
- 10
10. Trykværk ifølge et hvilket som helst af kravene 2-9, k e n d e t e g n e t ved, at overføringsvalsen, som er i kontakt med trykværkets plate-cylinder, er monteret i offsetmaskinens lejringsring for en traditionel overføringscylinder i et fugteværk, og at plate-cylinderen samtidig er i kontakt med to enheder omfattende en kammerrakel samt overføringsvalser til påføring af lak henholdsvis vand til plate-cylinderen.

SAMMENDRAG

FREMGANGSMÅDE TIL DRIFT AF ET TRYKVÆRK SAMT TRYKVÆRK TIL OFFSETMASKINE.

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Der beskrives et trykværk (1) til brug i en offsetmaskine. Trykværket gør det muligt at få en bredere anvendelse af offsetmaskiner (1). Dette opnås ved at lakpåføringsorganerne og vandpåføringsorganerne omfatter en enhed (28), der består af en kammerrakel (30) samt mindst en valse (29,32) til overføring af lak eller vand fra kammerraklen

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(30) til trykværkets plate-cylinder (15).

Fig. 1,3 og 4.

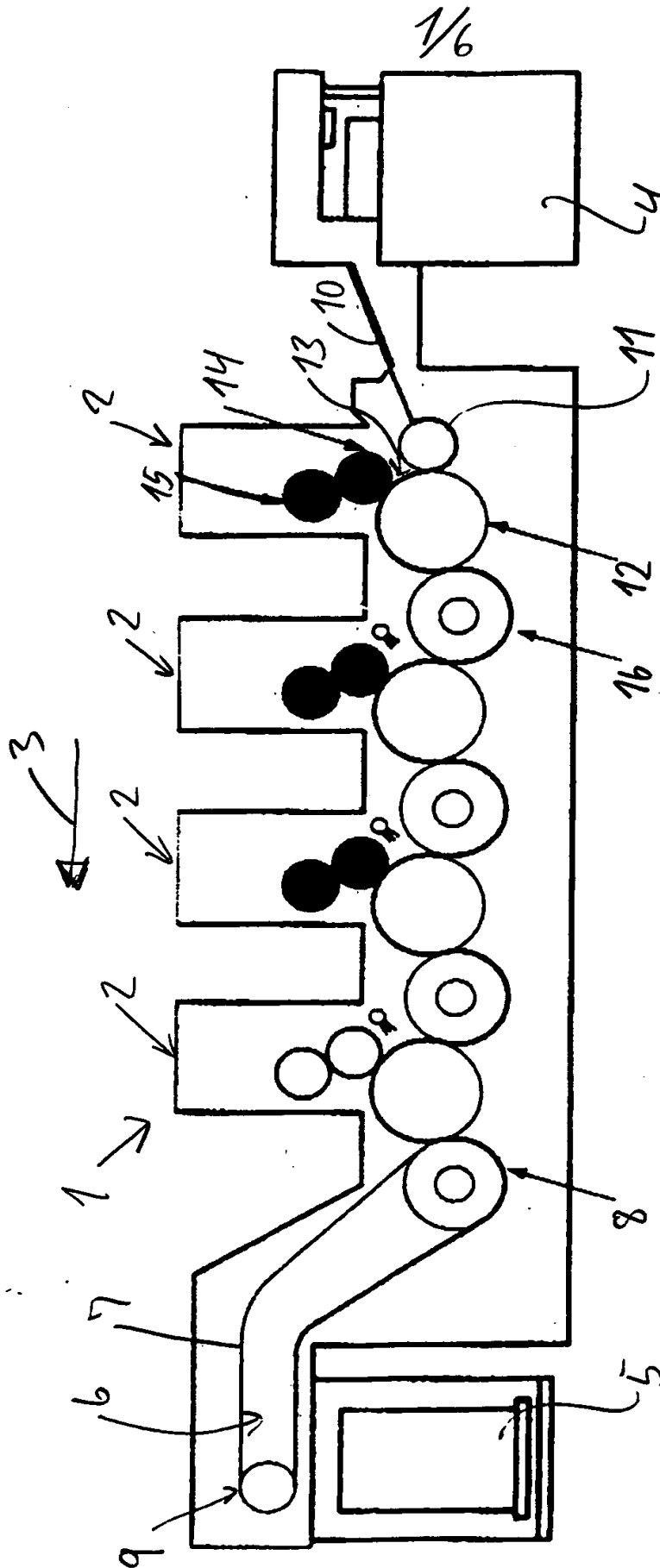


FIG. 1

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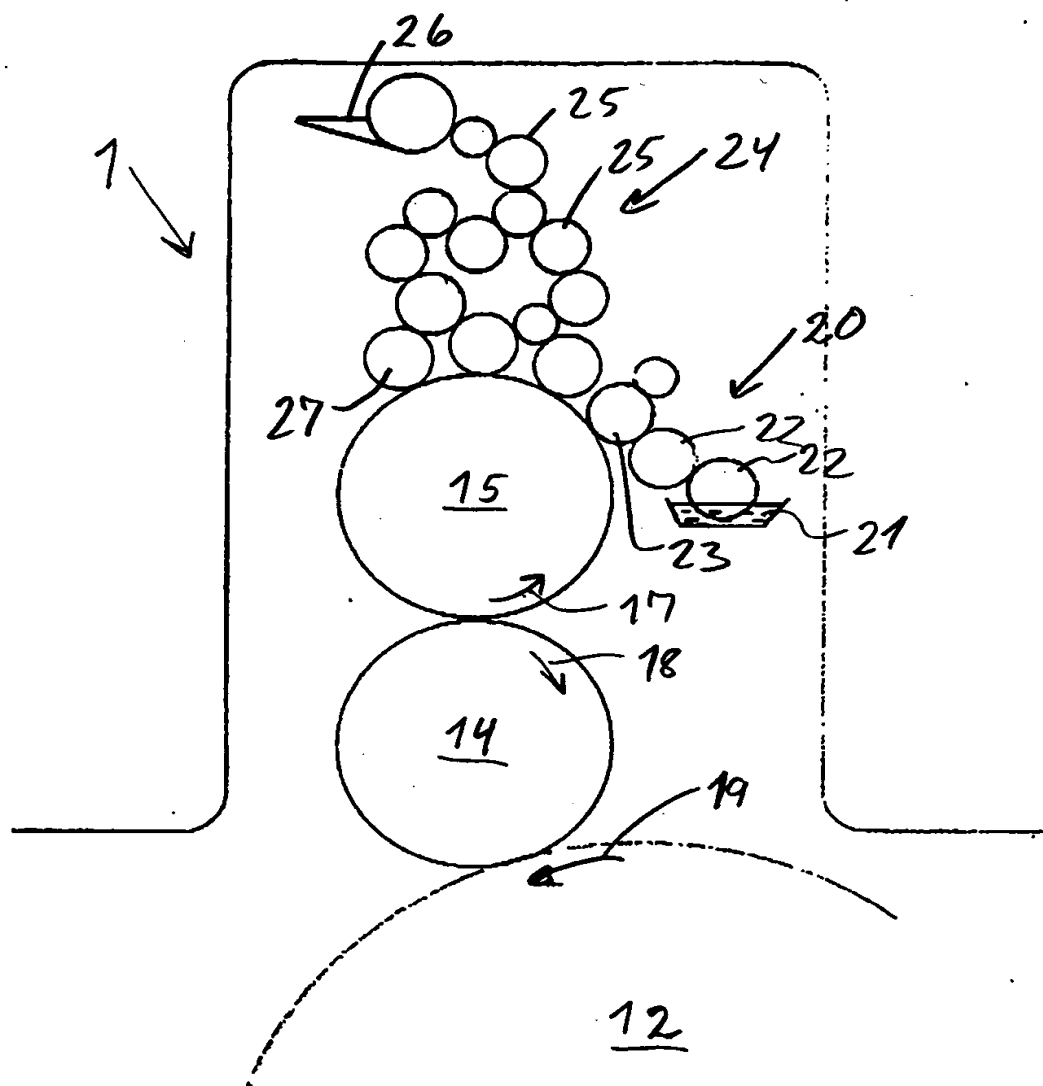


FIG. 2

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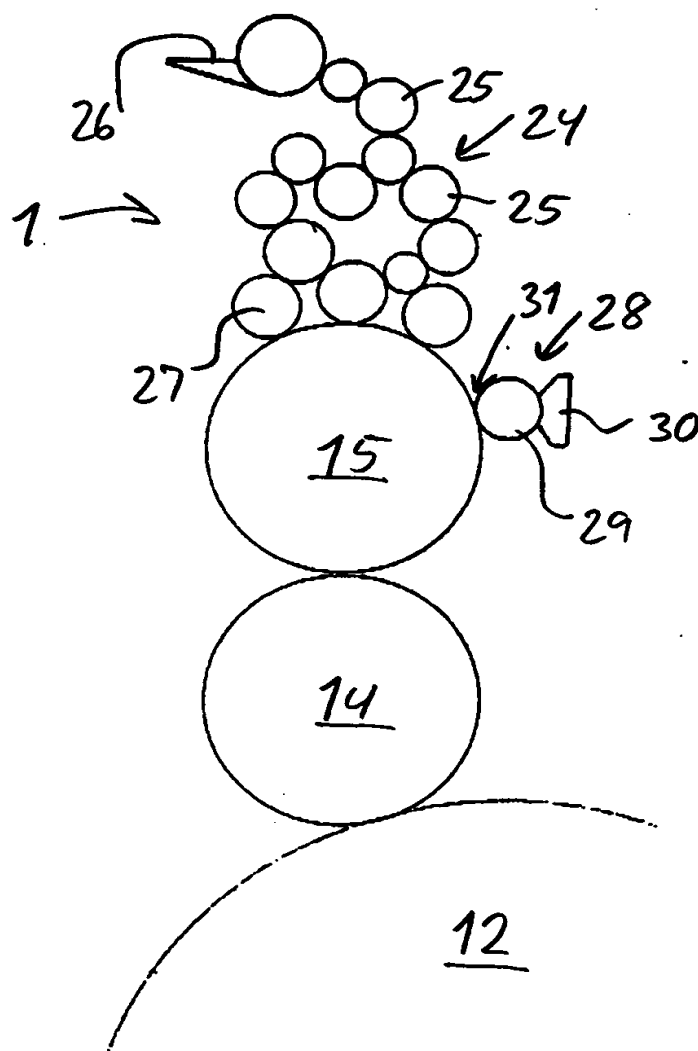


FIG. 3

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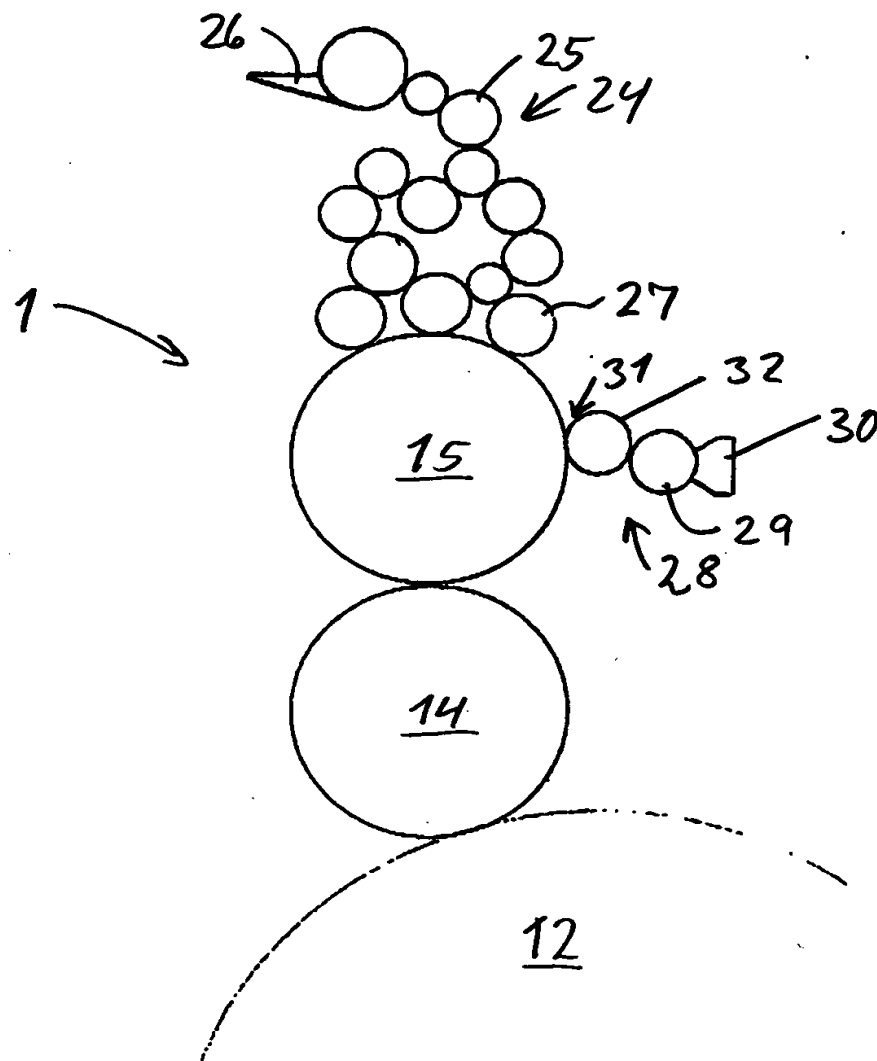


FIG. 4

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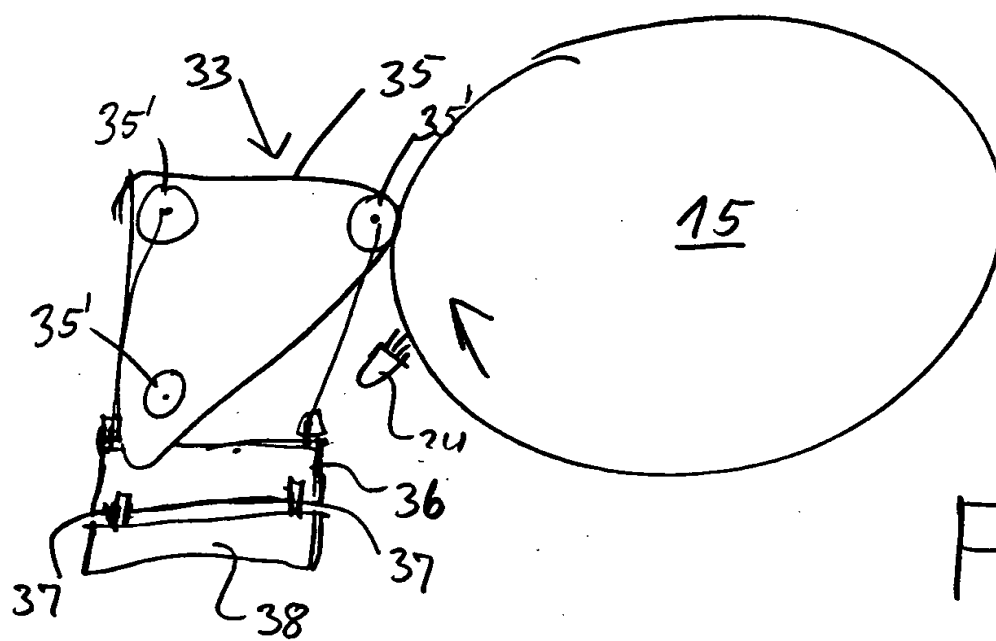


FIG. 5

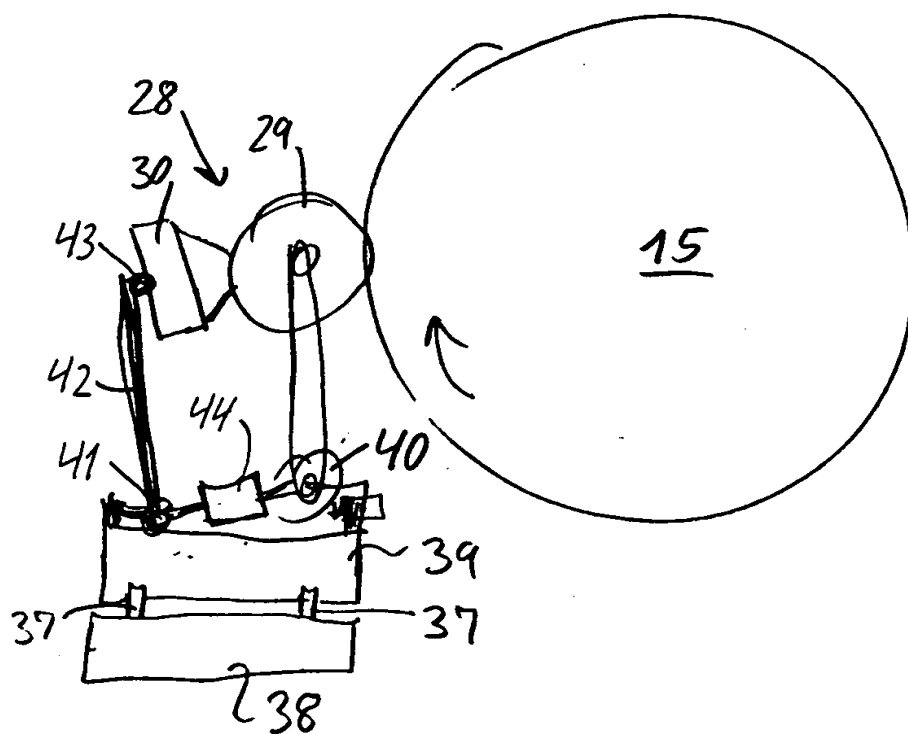


FIG. 6

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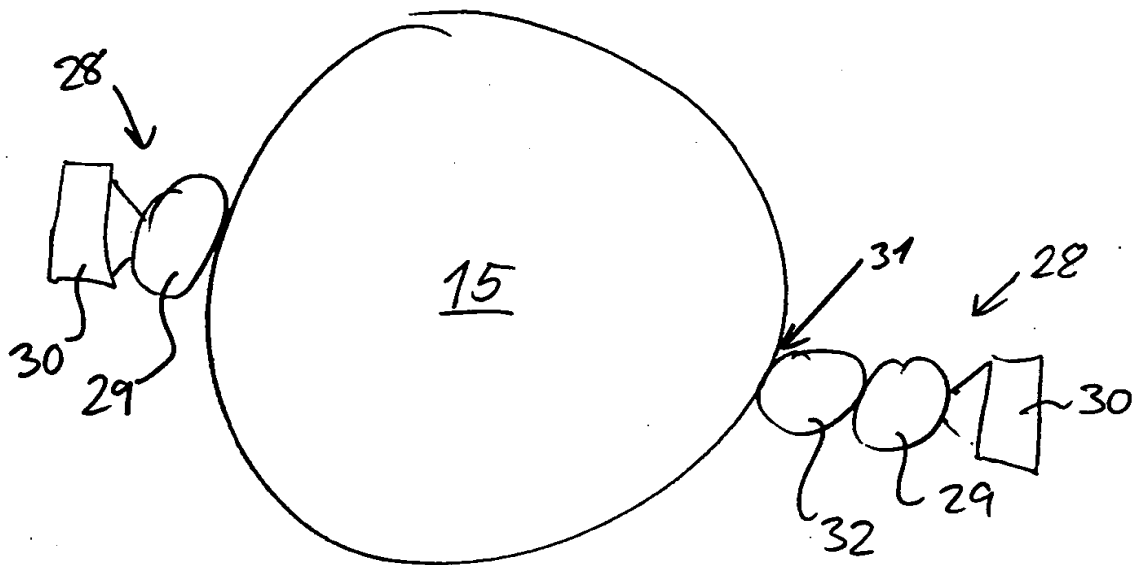


FIG. 7

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 9217WO/LN/sn	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/DK98/00303	International filing date (day/month/year) 02/07/1998	Priority date (day/month/year) 03/07/1997
International Patent Classification (IPC) or national classification and IPC B41F7/26		
Applicant TRESU A/S et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 4 sheets, including this cover sheet.

- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 03/02/1999	Date of completion of this report 01.10.99
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Sartor, M Telephone No. +49 89 2399 2793 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/DK98/00303

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-9 as originally filed

Claims, No.:

1-10 as originally filed

Drawings, sheets:

1/6-6/6 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/DK98/00303

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-10
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-10
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-10
	No:	Claims	

2. Citations and explanations

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/DK98/00303

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. The relevant state of the art is EP-A-574 124 (cited as A in the search report) which discloses a method of operation of a printing unit in an offset machine, wherein said printing unit comprises a doctor blade chamber device which is used for lacquer application or for ink application.
A method according to claim 1 differs from the known one in that the doctor blade chamber device which is used for lacquer application is used

(a) also as dampening unit for water application.

A method according to claim 1 is therefore new (Art. 33 (2) PCT).

The problem to be solved is to allow a broader use and a more effective operation of a printing unit in an offset machine.

None of the documents cited in the search report suggests the feature (a) of claim 1 in order to solve said problem.

A method according to claim 1 involves therefore an inventive step (Art. 33 (3) PCT).

Accordingly also a printing unit according to independent claim 2 is new and involving an inventive step.

It is to be noted that the document GB-A-2 119 711, cited in the search report as X, fails to disclose a doctor blade chamber device.

It must therefore be considered as A.

2. Dependent claims 3-10 are also new and involving an inventive step.

Re Item VII

Certain defects in the international application

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document EP-A-574 124 is not mentioned in the description, nor is this document identified therein. ✓